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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/823,353	04/13/2004	Phillip C. Watts	028058-000110US	4721

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EXAMINER	
MOWLA, GOLAM	

ART UNIT	PAPER NUMBER
1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/823,353	WATTS, PHILLIP C.	
	Examiner	Art Unit	
	GOLAM MOWLA	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 April 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *8-22 and 24-38* is/are pending in the application.

4a) Of the above claim(s) *17-22* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *8-16 and 24-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04/02/2010 has been entered.

Response to Amendment

2. Applicant's amendment of 04/02/2010 does not place the Application in condition for allowance.

3. Claims 8-22 and 24-38 are currently pending. In response to Office Action dated 02/02/2010, Applicant has amended claim 1, cancelled claims 1-7 and 23, and added new claims 32-38.

4. Claims 17-22 are withdrawn from consideration as being part of non-elected invention.

Status of the Objections or Rejections

5. The objections to the Specification from the Office Action dated 02/02/2010 are maintained.

6. The rejection of claims 8-16 and 24-31 from the Office Action dated 02/02/2010 is still maintained. New ground of rejection is presented below for the newly added claims 32-38.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 27-29 and 32-38 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 27 recites the limitation "a common inlet through which the second fluid is received for distribution to all of the second thermal modules" which is not supported by the original disclosure as filed. Figures 1 and 2 of the instant invention show two inputs (6 and 9).

Claim 28 recites the limitation "both fluids are liquids," which is not supported by the original disclosure as filed. Although the specification discloses the use of water as the fluid, the original specification fails to provide support that at the time of the invention applicant has possession to every possible kind of heat transfer liquid such as liquid metals, ammonia or methyl alcohol to name a few. See US 4011104 which lists liquid metals, ammonia or methyl alcohol as the heat transfer liquid.

Claim 32 recites the limitation "**at least two** of the plurality of second thermal modules reside on one side of the first thermal module" in lines 2-3, which is not supported by the original disclosure as filed. Instant disclosure in figures 1-2 explicitly shows that only one cold block (claimed second thermal module) (either 1 or 3) is on one side of the first thermal module

(hot block 7). Cold blocks are bifurcated at position 5, and therefore, it can be interpreted that two of the plurality of second thermal modules reside on one side of the first thermal module. "At least two" is open-ended and includes more than two of the second thermal modules on one side of the first thermal module. Therefore, instant disclosure does not provide support for "**at least two** of the plurality of second thermal modules reside on one side of the first thermal module".

Claim 33 recites the limitation "the two second thermal modules that are on one side of the first thermal modules are flexibly coupled to each other" in lines 3-4, which is not supported by the original disclosure as filed.

Claim 34 recites the limitation "the two second thermal modules that are on one side of the first thermal module are flexibly coupled to each other such that the second fluid flows through the respective second passages of both of the second thermal modules that are on one side of the first thermal module" in lines 3-5, which is not supported by the original disclosure as filed.

Claim 35 recites the limitation "a compliant member that seals between the two respective second passages" in line 3, which is not supported by the original disclosure as filed.

Claim 36 recites the limitation "a compliant member between the two second thermal modules that are on one side of the first thermal module, and a mechanism that connects the two second thermal modules and applies pressure to the compliant member" in lines 3-5, which is not supported by the original disclosure as filed. The claim is interpreted to mean a o-ring slip joint between the between the two second thermal modules that are on one side of the first thermal module as shown in figure 2.

Claim 37 recites the limitation "the mechanism is a dogleg feature" in line 3, which is not supported by the original disclosure as filed. The claim is interpreted to mean a o-ring slip joint between the between the two second thermal modules that are on one side of the first thermal module as shown in figure 2.

Claim 32 recites the limitation "**at least two** of the plurality of second thermal modules reside on a second side of the first thermal module, both of their respective thermoelectric modules being in contact with a second planar face of the first thermal module" in lines 2-5, which is not supported by the original disclosure as filed. Instant disclosure in figures 1-2 explicitly shows that only one cold block (claimed second thermal module) (either 1 or 3) is on one side of the first thermal module (hot block 7). Cold blocks are bifurcated at position 5, and therefore, it can be interpreted that two of the plurality of second thermal modules reside on one side of the first thermal module. "At least two" is open-ended and includes more than two of the second thermal modules on one side of the first thermal module. Therefore, instant disclosure does not provide support for "**at least two** of the plurality of second thermal modules reside on one side of the first thermal module".

Claim Rejections - 35 USC § 102

9. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

10. Claims 8-15, 24-25, 27-28, 30-35 and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by DeBucks (US 3,607,444).

Regarding claims 8 and 14-15, DeBucks discloses a thermoelectric generator (figs. 1-4) (3:14-5:40) for generating electricity from a temperature differential between a first fluid (hot fluid in heat exchanger 17) (fig. 4) (1:2-8) and a second fluid (cold fluid in heat exchanger 16) (fig. 4) (1:2-8), the thermoelectric generator comprising:

- a plurality of thermoelectric modules (see fig. 4 which shows plurality of TE modules comprising TE elements 1), wherein:
    - each of the thermoelectric modules comprises a first side (top/bottom) and a second (bottom/top) side (see fig. 4); and
    - each of the thermoelectric modules generates electricity when there is a difference in temperature between the first side (top/bottom) and the second side (bottom/top);
- a first thermal module (heat exchanger part 17), wherein:
    - the first thermal module (17) comprises a first block (see fig. 4 which shows the rectangular block) including a first passage (18) through which first passage (18) the first fluid flows through the block (17) (5:28-34) ; and
    - the first thermal module (17) is configured to exchange heat with the first sides (top/bottom) of at least two of the plurality of thermoelectric modules (TE modules comprising TE elements 1); and
- a plurality of second thermal modules (16), wherein:
    - each of the plurality of second thermal modules (16) comprises a respective second block (16) including a respective second passage

through which second passage the second fluid (cold fluid) flows through the respective second block (16) (5:28-34); and

- a side of each of the second thermal modules (16) is configured to exchange heat with exactly one of the thermoelectric modules through the second side (bottom/top) of the respective thermoelectric module (see figs. 1-4); and
- each of the second thermal modules (16) accommodates all axis mechanical variance in its respective thermoelectric module (4:71-75).

"Bock" is defined as "a solid piece of something" (http://define.com/block). Since the element 16 of DeBucks is made of solid spring steel material, it reads on instant second block. . Applicant argues that "" (see Remarks, page).

Regarding claims 9-13, the reference further discloses a compression mechanism comprising spring (spring material of the tube) and a rod (10) (see fig. 1), wherein the compression mechanism is operably coupled with two of the plurality of second thermal modules (16) such that first thermal module (17) and at least one of the plurality of thermoelectric modules (1) is compressed between two of the plurality of second thermal modules (16) (3:43-4:75). Since the compression mechanism comprises rod and spring as claimed in the instant Application, the compression mechanism is inherently configured to compress with an actively variable force, to compensate for thermal expansion and thermal contraction of at least one of the plurality of second thermal modules, and to compensate for stack tolerance build-up of the plurality of second thermal modules. Claiming of a new use, new function or unknown property

which is inherently present in the prior art does not necessarily make the claim patentable. See MPEP §2112. See also *In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977).

Regarding claim 24, DeBucks further discloses that the first fluid (fluid at the hot side) is at a higher temperature than the second fluid (fluid at the cold side) (the fluid at the hot side inherently is at a higher temperature than the fluid at the cold side).

Regarding claim 25, the heat exchanger (16/17) inherently has inlet though which it receives fluid from external reservoirs.

Regarding claim 27, the reference further discloses a common inlet (flow channel) through which the second fluid is received for distribution to all of the second thermal modules (5:27-34).

Regarding claim 28, the reference further discloses that the first and second fluids are liquids (1:2:8).

Regarding claims 30 and 31, the reference further teaches that the thermal modules are rectangular (see fig. 4 for configuration).

Regarding claim 32, the reference further teaches that at least two of the plurality of second thermal modules (16) reside on one side (top or bottom) of the first thermal module (17) (see figure 3), both of their respective thermoelectric modules being in contact with one planar face of the first thermal module (17).

Regarding claims 33 and 34, the reference further teaches that the two second thermal modules that are on one side of the first thermal module are flexibly coupled to each other (the use of spring materials allows the blocks 16 to be flexibly connected to each other) (4:60-78)

such that the second fluid (cold fluid) flows through the respective second passages of both of the second thermal modules (16) that are on one side of the first thermal module (17).

Regarding claim 35, the reference further teaches a compliant member (spring material of the tube 16) that seals between the two respective second passages.

Regarding claim 38, the reference further teaches that at least two of the plurality of second thermal modules (16) reside on a second side (bottom/top) of the first thermal module (17) (see figure 3), both of their respective thermoelectric modules being in contact with a second planar face of the first thermal module (17).

Claim Rejections - 35 USC § 103

11. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

12. Claims 16 and 36-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeBucks as applied to claim 8 or 32 above, and further in view of Sorber (US 4,564,504).

Regarding claims 16 and 36-37, Applicant is directed above for complete discussion of DeBucks with respect to claim 8 or 32, which is incorporated herein. DeBucks is silent as to the use of o-ring slip joint to couple at least one of the plurality of the second thermal modules with at least one other of the second plurality of first thermal modules.

Sorber teaches the use of o-ring slip joint between a pipe and cooling tower house facilitates the expansion and contraction of the cooling tower components during the process (col. 2, lines 1-4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have used the o-ring slip joint of Sorber in the thermoelectric generator of DeBucks in order to facilitate the expansion and contraction of the components of the heat sink of DeBucks, as taught by Sorber.

13. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over DeBucks as applied to claim 8 above.

Applicant is directed above for complete discussion of DeBucks with respect to claim 8, which is incorporated herein. DeBucks is silent as to whether the fluids are recirculated, i.e. the first fluid and the second fluid circulate to and from external storage reservoirs.

However, it would have been obvious to one of ordinary skill in the art at the time of the invention to have the fluids recirculated such that the thermoelectric module can use the same fluids to generate electricity up until the fluids reach at an equilibrium temperature.

14. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over DeBucks as applied to claim 28 above, and further in view of Hed (US 5,228,923).

Applicant is directed above for complete discussion of DeBucks with respect to claim 28, which is incorporated herein. DeBucks is silent as to whether the liquid is water.

Water is a well-known heat transfer material which is widely used in the thermoelectric generator, as shown by Hed (10:16-22).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized water as the fluid in the thermoelectric generator of DeBucks, because

selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See MPEP § 2144.07.

Response to Arguments

15. Applicant's arguments with respect to claims 8-16 and 24-38 have been considered but are moot in view of the new ground(s) of rejection as necessitated by the amendments.

With respect to new matter issue of claim 27, Applicant argues that paragraph [0010] of the specification clearly states that in the embodiment shown in Figure 1, "[c]old water enters via number 9 and exits number 12." As can be seen in Figure 2, inlet 9 is connected to a network of channels enabling fluid to flow through all of the second thermal modules.

The Examiner respectfully disagrees. Figure 1 and 2 show two inlets (6 and 9) and therefore there can not be a common inlet.

With respect to new matter issue of claim 28, the specification clearly indicates that both fluids can be water. (Specification paragraph [0010]). As is well known, water is a liquid and therefore the specification has support for "liquid".

The Examiner respectfully disagrees. Although the specification discloses the use of water as the fluid, the original specification fails to provide support that at the time of the invention applicant has possession to every possible kind of heat transfer liquid such as liquid metals, ammonia or methyl alcohol to name a few. See U.S. Patent 4,011,104 which lists liquid metals, ammonia or methyl alcohol as liquids that can be used as the heat transfer fluid.

On page 11 of Remarks, Applicant argues that DeBucks fails to disclose a plurality of second thermal modules having respective second block because the elements 16 are not blocks but are "tubes" made for example of spring steel and are "elastically deformable in the axial direction of the thermocouple element legs ...." (DeBucs col. 4 lines 62-73).

The Examiner respectfully disagrees. One accepted definition of "block" is "a solid piece of something" (http://define.com/block). Since the element 16 of DeBucks is made of solid spring steel material, it reads on instant second block. . Applicant argues that "" (see Remarks, page).

Correspondence/Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GOLAM MOWLA whose telephone number is (571) 270-5268. The examiner can normally be reached on M-Th, 0800-1830 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ALEXA NECKEL can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/G. M./
Examiner, Art Unit 1795

/Alexa D. Neckel/
Supervisory Patent Examiner, Art Unit 1795